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**Subject:** Microsoft Settlement

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Remarks on the proposed settlement of the Microsoft anti-trust case.

This piece is not comprehensive, but the analytical and historical points I make apply to most aspects of the problem.

Among the different classes that are impacted by the Microsoft monopoly are the classes that buy Microsoft as consumers, producers and vendors. I contend that these direct victims are not its principal victims.

I identify three principal classes of victims:

- 1) Those (such as myself) engaging or aspiring to engage in Microsoft-free microcomputing.
- 2) Those through choice of employer, authority, supplier, customer, or other outside relation or agency are compelled to work with Microsoft products. These people suffer contact with inferior products and the spiritual stress of contact with an enterprise whose "business model" is founded on the stifling of human cooperation and technical advance. (It is disgraceful that children should be exposed to Microsoft Windows in schools; this kind of publicly sanctioned exposure is harmful to their education and to their moral development).
- 3) The General Public.

I write primarily on behalf of Microsoft-free microcomputing and to a large extent for the General Public and the national interest.

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This response is organized in the following manner:

- 1) What is an Operating System, and what Microsoft has converted it into.
- 2) How is this monopoly harmful and dangerous?
  - a) Economic costs of Microsoft's monopoly
  - b) Supposed costs of remedies
  - c) Broader costs and dangers
- 3) Why the proposed remedies are either useless or counter-productive.
- 4) Some recommendations for remedy.

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- 1) What is an Operating System, and what Microsoft has converted it into.

The Operating System (OS) is a system of programs that runs the computing machinery, placing the machinery under a unified control so that it can service the other programs (the "jobs") running on the computer and regulate their contention for resources. The OS provides programs with an environment and a set of standards for accessing that environment. Programs are ordinarily written to the environment provided by the OS, not directly to the machinery.

Microsoft does not share the "naive" view of a computer held by entrepreneurs, workers, scientists, engineers, programmers, students, or ordinary users, viz., of a computer as a machine for extending and multiplying capabilities. Microsoft sees computers as something for which access can be restricted and ransomed for profit, and sees the operating system as a particularly strategic chokepoint. To Microsoft, a computer is not an engine, but a venue for selling applications. In this view, computer capabilities do not flow from Microsoft, they are withheld by Microsoft and released in restrictive form.

## "MS-Windows - the Inextricable DOS"

MS-Windows is a computer program effecting the illegitimate and technically unnatural integration of non-operating system functionality into the OS for the sole purpose of fortifying and extending Microsoft's MS-DOS monopoly. (In the current DMCA vernacular, some might call it "an anticompetition device."). MS-Windows is designed to ensure 1) that competing operating environments (e.g., Geoworks, Quarterdeck, HP) will not be viable on a Microsoft platform, 2) that the degree of control exercised by Microsoft over applications will be greater than that which would be possible in DOS, and 3) that the operating system, operating environment, user interface, and application programs will be so entangled as to deliberately block the government from being able to separate them (separation is a necessary step in the type of approach that the governments are now pursuing). By blurring these boundaries, Microsoft creates a burden-barrier to economic evaluation, law enforcement, industry, competitors, and government regulators. Thus, any application running on MS-Windows that Microsoft covets, it has the power to appropriate.

Poor security was already a hallmark of Microsoft Operating System, but it is a necessary by-product of the attempt to create a monopoly-application posing as an operating system because of the artificial integration of the application-level ("user space") with the operating system. (A significant share of the economic damages caused by Microsoft is attributable to its faulty security).

It is not really possible to write a good system that runs on a bad operating system. When the Operating System overwrites memory locations or crashes without recovery, the application suffers. A large portion of the resources of the development process must be diverted to "defensive programming", an attempt to protect the integrity of the program and data from the defects of its running environment, an attempt which can only be partly successful at best.

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2) How is this monopoly harmful and dangerous?

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2a) Economic costs of Microsoft's monopoly

In 1983, the issue may have been Microsoft overcharging customers. At that time, the spectacle of Microsoft selling a badly broken Operating System and charging its victims for the repairs dominated the scene.

By 1984, Microsoft's monopoly was the central problem facing microcomputing. IBM-Microsoft was harming: 1) Digital Research, the leading low-end operating system 2) hardware manufacturers and vendors designing or selling non-compatible systems 3) software companies.

Microsoft's variant of DOS, ruthlessly extended by the creation of Windows was designed to trap customers into their proprietary closed "Microsoft market". As long as their software is incompatible with acceptable norms and established standards, technical, commercial and legal, their customer-victims will have to follow them to whatever computer platform and network site that Microsoft chooses.

An assessment of the costs to the economy of the Microsoft monopoly must include the enormous resources that were diverted to dealing with problems that existed only as a result of programming in the Microsoft environment, e.g., the years of 640KB limit, 'expanded and extended memory', inability to share peripherals because of a single-user limitation. These difficulties, tied exclusively to the Microsoft environment, added directly to the cost of development, linked software to transient problems, and were a barrier-to-entry, preventing programs from being written, products from being delivered

on time, etc.

Microsoft has been able to work with some manufacturers to create computer peripherals that have deliberately had vital parts removed so that they cannot function except with the antidote - the matching version of the Microsoft Windows Operating System. These crippled machines (many names including winmodems, winprinters) have introduced much uncertainty into the buying process, making purchases much more difficult, the end result much inferior even for those able to run these mutilated devices and the life expectancy of the equipment diminished as they are now wholly dependent on the version of MS-Windows.

The operating system defines the environment for software development. If the OS is replaced, the software will often not be portable.

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#### 2b) Supposed costs of remedies

Contrary to the impression of those outside the field, Microsoft's creativity has thus far been restricted to how to hold, strengthen and extend the monopoly it was given. The cost of dropping Microsoft is far from great because it is a hollow system that has never had the stability to allow programming, so few programs of long-term values have been written. Microsoft uproots its customers anyway as part of a business cycle posing as a product cycle, so there is effectively no cost to uprooting the system.

The question is not whether we are better off with Microsoft and today's computers than without Microsoft but with the computers before the IBM PC. Nor is it a choice of the chaos of freedom with incompatible zones of products versus the "order" of one dominant zone triumphant, albeit wholly incompatible with all others and unable to change. At every stage there were better alternatives and economic losses should be measured against contemporary alternatives. Superior alternatives that were driven off the field by Microsoft succumbed to monopoly power and not superior quality or lesser costs. The value of the choice to the decision maker was not based on technical merit but rather on permission to participate in a closed market.

The "network effect" here is not primarily a concomitant of the number of applications. That is a secondary cause of a more fundamental strategy of creating a network of captive users. The "network effect" is the number of captive users. Microsoft's market and its product are the network of customer-victims. The operating system is the chain that binds that network. This would not be the case with an open operating system, it is a consequent of deliberate artificial restrictions.

A cursory look at Microsoft's advertisements reveals what it thinks are its strongest assets.

1) Microsoft offers vendors and developers access to this large market. It is made to appear as if Microsoft were providing a service by building a market and making it accessible to commerce; in point of fact, Microsoft's role is to build a virtual wall and provide conditional entry on both sides of the gate, i.e., restricted access to the market and from the market.

2) Microsoft sells its business and marketing power. They say, "join our Program X (on their unfavorable terms) and we will include you in our profit world, providing contacts and customers."

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#### 2c) Broader costs and dangers.

MICROSOFT HAS PREVENTED SOFTWARE FROM BEING DEVELOPED, BY CHANGING THE

DEFINITION OF THE SOFTWARE ENVIRONMENT. A stable platform is a pre-condition for long-lasting software, and the long operational life of the software amortizes the development costs. THE MICROSOFT MONOPOLY ABORTED THE BIRTH OF AN AMERICAN SOFTWARE INDUSTRY (on the low end of computing). Indeed, the benefits of the special laws written to encourage the healthy growth of that industry have been reaped by the main forces set against its development.

The development of the "personal computer" has been greatly retarded by its diversion to the dead-end of the single-user system. A "personal computer" is in the first place a microcomputer. The same microcomputer is personal if used by one person in that way, and a group machine if used by a "group". With a multi-user operating system, different accounts can be set up and used concurrently, whether by a single person or a group of persons. Timesharing has been the norm in computing since the mid-nineteen-sixties; Microsoft is decades behind the industry. Compare the processor speed and memory of a 486 to a PDP-11! MS-DOS and MS-Windows are hopelessly uncompetitive on price/performance with multi-user DOS and Unix-like systems. (In a January 2002 column in ComputerWorld, Nicholas Petreley details how the latest version of MS-Windows is still sub-minimal in its ability to allow multiple users to function concurrently).

Computers are a technology that is inherently adaptable to personal styles of work. Microsoft has designed a system imposing a uniformity that undermines the liberating promise of this technology.

Not all software is an endpoint; software can be built on other software, e.g., customized macros. All of this is lost in the Microsoft environment. Microsoft is transience. The transience of Microsoft makes the solution of the problem before you relatively easy, since abolishing Microsoft will not hurt secondary developments. Old programs will not be lost -- Microsoft has already robbed its victims of any programs and experience they might have developed through time. (In contrast, the UNIX and VMS programs that I wrote since 1982 are still usable today. The investment in learning UNIX and in writing for UNIX is still amortizable, and will continue to be good for decades to come.)

The Proposed Final Judgment shows no cognizance of the breakthrough in computing in the 1980's that multiplies the potential for programs to build on other programs. The Free Software Movement is revolutionizing the organization of computing and the potential values of computers.

The PFJ exhibits a parochial view that ignores that the world at large will be building its computer infrastructure on free software implementing open standards.

With respect to the two principal classes of victims: those working outside that closed market, and humanity as a whole, which has suffered multi-trillion dollar losses. The solution should not be inclusion in that market, because that Microsoft-dominated market is qualitatively inferior. The solution is the dissolution of that market and the migration to other, superior markets.

It is anticipated that the 21st century will experience "Cyber Wars." Machines using Microsoft Windows are especially vulnerable and will be attacked. Every part of American life that relies on these systems will be placed in jeopardy by such an attack.

MS-DOS and MS-Windows are not secure. Every machine that is running such a system and is connected externally by network is vulnerable to attack. There is a multiplicity of vulnerabilities involved. It is common knowledge that Microsoft has a backdoor built into Windows -- that means that Microsoft has built a means of external entry into

Microsoft Windows; any program employing the entry sequence has complete control over the machine. Microsoft Windows is architecturally unsound and insecure -- once breached, too much of the system is exposed; application programs run with too much power over the system. Microsoft has designed Windows to spy on its customer-victims (e.g., to survey non-Microsoft products and to verify licenses); these features can be "cracked" and exploited by non-Microsoft attackers as well.

An Internet Service Provider can read and store all traffic passing through its system. Control over ISPs gives Microsoft access not only to the work of their customers, but to all the email sent by their customers to innocent third parties. This power plus the power to read all networked machines running Windows adds up to a greater power than either taken severally.

As the world's citizens begin to employ higher quality, non-Microsoft systems that express true American values, our technological, industrial and military superiority will fade. (Already the export of Microsoft products to foreign markets is damaging the reputation of U.S.-made goods).

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3) Why the proposed remedies are either useless or counter-productive.

Many of Microsoft's improper and criminal activities have been exposed and addressed in prior cases. This proposed remedy and this proposed settlement offer a woefully inadequate structural framework for addressing these problems. Any analysis of how Microsoft expanded its monopoly and responded to previous failed attempts at correction would be sufficient to show that Microsoft has shown itself immune to these remedies.

Since an unambiguous specification of the system is not feasible given even the best intentions, it is always possible to claim compliance with the Decree while maintaining effective incompatibility.

A computer in a networked environment should not be considered personal. If Microsoft's market is defined as personal computers, the court will miss its mark. Microsoft is moving its market to the network, where the environment will be rental license-enforcing, insecure and privacy violating. Microsoft is able to tap and control computers running Microsoft Operating Systems owned by government, business, religious and non-governmental organizations, schools, research establishments, accounting and law firms, medical practices, and private individuals and families.

A secret OS and secret applications are able to work together secretly. MS-Windows can store information anywhere without the knowledge of the user. The OS has access to everything on the system. If encryption is done with software that Microsoft can identify, the OS can copy the plaintext that is being encrypted; and vice versa for the decryption.

In the absence of general legislation regulating the use of, and providing for inspection of, all source-secret software sold to the public and used by the government, the court must make decisions on how to counter this threat when exercising its supervisory power in cases such as this, where such software can be used in violation of antitrust laws.

The objective should not be minor adjustments to the profit-imbalance that exists for producers in that market. It is that closed market itself that should be the objective of the antitrust forces. THE AIM SHOULD BE THE MIGRATION OF TRAPPED CUSTOMERS OUT OF THE MARKET.

This Proposed Final Judgment allows Non-Disclosure Agreements (NDAs). These agreements have been used by elements of the computer industry to circumvent (First Amendment) freedoms and to manipulate

affairs to cover up information perceived by them as potentially damaging to them and to suppress progress.

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4) Some recommendations for remedy.

It is critical for the remedies in the cases that have been and will be filed against Microsoft to define the monopoly in terms of the customer base and the software, not solely in terms of the hardware. Microsoft was not a computer manufacturer prior to the Xbox (peripherals aside). Microsoft enjoys a monopoly position on "personal computer" or "Intel-compatible"-based microcomputers, and that monopoly needs to be addressed. Failure to acknowledge and address the other end of the monopoly (or the other monopolies) will mean that neither the discourse, nor the remedial action, will be able to track Microsoft across changes of hardware to handheld, "game computers", embedded devices, cable television and set-top boxes, assaults on the Internet and telecommunications, copyright enforcement, and the Microsoft charity racket, and extortion operations that rely on privacy violations and access to computers and Internet packets.

Compatibility with previous versions must be demanded and enforced. Programs written for a given version will be broken by revision (called by Microsoft "Service Packs"). When software is changed, the system often breaks. So-called "upgrades" need to be rigorously backward compatible to avoid this. Customers do not want their working environment and their archives made unreliable or unusable by these forced purchases.

The file formats, communications protocols, interfaces and any other related material that is necessary to the migration of data tied to any application needs to be available to competing products and any other program for any purpose. It should be published and disclosed in full, at once and maintained for each revision on a timely, ongoing and accurate basis. Such disclosure must be in a form where anyone can access this material outside of Microsoft's knowledge, and with full indemnification from any so-called "intellectual property" issues. The interfaces and formats, like the "look-and-feel" are not the product, and should be considered as public domain, not as proprietary. The restrictions in the PFJ III. D and E are completely unacceptable; they are counter to the goals of the judgment. The goal should include that authors or companies engaged in developing conversion programs or products, in whole or in part, or providing such programs or services will be free to do so without any debt, royalty or obligation to Microsoft, its subsidiaries or partners.

It is imperative to address boot problems such as mandating that Microsoft will not require a particular sector, partition, or drive and possibly providing penalties for interference by Microsoft with installation of other systems, for example, by erasing or destroying the integrity of other partitions.

Copyright the screen?

In the appeal of this very case, Microsoft claims that because they copyrighted the appearance of their product's image, they should be able to prevent the owner of the screen from displaying a related image. Please consider the clear implications of this ownership argument for all the other copyrighted screen images in the world.

Following the bombing of the World Trade Center, the Red Cross had to put out a call for Microsoft licenses. It should be made clear to everyone in the world that license restrictions have no force in emergencies. Attempts by companies such as Microsoft to put automatic license enforcement into software can potentially result in death, possibly on a large-scale.

On remedy by disclosure of API's:

Microsoft programmers in other parts of the company have access to these critical details in advance of their competitors and can influence the design decisions. A wall of separation is a necessity, so that no internal or privileged communications occur. (See for example Network Solutions, Inc. where such a wall has been created between the registration of domain names and the database implementation. (I have no knowledge of whether this has proven successful, but I cite it as a precedent for this approach, perhaps worthy of investigation.))

Microsoft has the sole power to decide and effect changes. One of the central problems in software maintenance is the cost of changed designs, including interfaces. In particular, this is a major concern of the area known as "Object-Oriented Programming" (committing to an interface is considered by some authors as a "contract" between the programmer/designer and the user of the program interface).

Computer programs are best written by individuals or small teams. In any large project, and Microsoft Windows is one of the largest, no programmer or manager can comprehend or control the situation, even with full access and authority. There are multiple versions, some written specifically for individual OEMs and clients (and doctored versions submitted to courts), and multiple revisions. The capability of even Microsoft to find what it wants and effect changes that it wants is costly and limited. This is further compounded not only by the complications resulting from proven misconduct but by the quality of Microsoft's design, programming and development environment. An inspector or team of inspectors appointed by the Court would have limited capabilities even under the dubious assumption of a willing and helpful host.

Make sure that inspectors are not limited to read-only access. The rules of engagement must include the ability to copy, modify and test the programs in whole or in part, in special environments and in conjunction with any programs immunized from all licensing restrictions. Non-disclosure agreements have been used to neutralize critics, by exposing them to material covered by the NDA.

Divest all Internet-related holdings including UUNet, Spyglass and hotmail. Terminate the NCSA Mosaic license to Spyglass.

The proposed final judgment focuses too narrowly on the motive of large profits in its analysis of the dynamics of the computer market. Most authors of books, articles, music, poetry, and computer programs do not have such an expectation, and are thus not motivated by it. The force of not-for-profit work in computers is an indisputable fact. (The Internet was built by volunteers). This Judgment threatens to strangle these great creative forces.

I urge all actors in this case to exercise the options under the Tunney Act and withdraw the proposed settlement.

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